

Customer No. 38107**In the Specification**

Please replace the first full paragraph on page 3 of the specification with the following:

A particular embodiment of a device according to the invention is characterized in that a cross-sectional heat transfer coefficient  $\theta = \varphi/P_{\max}$  of the thermal connection is smaller than  $0.0005 \text{ K}^{-1}$ , wherein (in kW/K) is the rate of cross-sectional heat transfer via the thermal connection per unit of difference between an average temperature of the heat absorbing member and a temperature at a thermal boundary between the thermal connection and the cooling system, and wherein  $P_{\max}$  (in kW) is a maximal output power of the source allowed during continuous operation of the device. If said cross-sectional heat transfer ratio  $\theta$  is smaller than  $0.0005 \text{ K}^{-1}$ , a relatively high maximal temperature of the heat absorbing member is achieved during operation, so that the mass and volume of the heat absorbing member, which are necessary to enable the heat absorbing member to absorb a sufficiently large amount of heat, are considerably reduced.

Please replace the first full paragraph on page 8 of the specification with the following:

In the device according to the invention, the intended relation between  $Q_A$  and  $Q_T$  as described before is achieved in that the thermal connection between the heat absorbing member 45 and the cooling system 51 comprises a thermal barrier  $\varphi$  which limits the rate of cross-sectional heat transfer (in kW/mK) occurring via the thermal connection per unit of temperature difference between the heat absorbing member 45 and the cooling system 51. It is noted that in the definition of  $\varphi$  said temperature difference is the difference between an average temperature  $T_A$  of the heat absorbing member 45 and a temperature occurring at a thermal boundary between the thermal connection and the cooling system 51, i. e. at a location where the cooling liquid in the cooling system 51 is in direct thermal contact with the thermal connection. In the first embodiment shown in Figures 1 and 2, said thermal barrier comprises a mounting member 57 by means of which the heat absorbing member 45 is mounted in the vacuum space 3 between the source 5 and the carrier 7. The value of  $\varphi$  is effectively reduced in that a dimension  $h_B$  of the mounting

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member 57, seen in a direction X parallel to the electron beam path 37, is substantially smaller than a dimension  $h_A$  of the heat absorbing member 45 in said direction X, so that the mounting member 57 has a relatively small cross-sectional area available for the conduction of heat. A predetermined limitation of the value of  $\phi$  can be achieved by a suitable value of said cross-sectional area, i. e. by a suitable value of  $h_B$ . Since the value of  $\phi$ , i.e. the cross-sectional thermal conductivity of the thermal connection between the heat absorbing member 45 and the cooling system 51 is limited, a relatively high maximal temperature of the heat absorbing member 45 is allowed and achieved during the generation of the X-rays 41. As a result of said allowed relatively high maximal temperature, only a relatively small mass and volume of the heat absorbing member 45 are required to provide the heat absorbing member 45 with a sufficiently high heat absorbing capacity. In the first embodiment, the heat absorbing member 45 is made from molybdenum which has a relatively high melting temperature of approximately 2600 °C. Alternatively, another material having a relatively high melting temperature may be used, such as tungsten or graphite. With such materials, relatively high temperatures of approximately 2000 °C of the heat absorbing member 45 are allowed, so that a considerable reduction of the necessary mass and volume of the heat absorbing member 45 is achieved.

Please replace the paragraph beginning on page 9 with the following:

In the first embodiment shown in Figures 1 and 2, the value of  $\phi$  is further reduced in that the mounting member 57 is made from a material having a thermal conductivity which is smaller than a thermal conductivity of the material from which the heat absorbing member 45 is made. In this embodiment, the mounting member 57 is made from stainless steel, which is a very suitable material in view of its heat conducting properties, its thermal expansion properties, and its mechanical properties. In the first embodiment, the value of  $\phi$  is further reduced in that the mounting member 57 is in thermal contact with the heat absorbing member 45 near a second side 59 of the heat absorbing member 45 facing away from the carrier 7. Near this second side 59, during operation, the heat absorbing member 45 has a temperature which is lower than the average temperature  $T_A$  of the heat absorbing member 45 and lower than a temperature of the heat absorbing member 45 near a first side 61 which faces the carrier 7, so that  $Q_T$  is further limited. In the first embodiment, as a

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result,  $Q_T$  has a maximal value of approximately 10 kW, which value occurs when the average temperature  $T_A$  is approximately 2000 °C. Thus, the value of  $\phi$  is approximately 5 W/mK. In order to relate the value of  $\phi$  to the total power and capacity of the device, a cross-sectional heat transfer coefficient  $\theta$  (in mK<sup>-1</sup>) of the thermal connection between the heat absorbing member 45 and the cooling system 51 is defined as  $\theta = \phi/P_{\max}$  wherein  $P_{\max}$  (in kW) is a maximal output power of the source 5 allowed for continuous operation of the device. In the first embodiment  $P_{\max}$  is approximately 25 kW, so that  $\theta$  is approximately 0.0002 mK<sup>-1</sup>. It is noted however that also for larger values of  $\theta$  a considerable reduction of the mass and volume of the heat absorbing member 45 is already achieved. It has been found that a useful and favorable reduction of the mass and volume of the heat absorbing member 45 within the meaning of the invention is achieved for values of  $\theta$  smaller than approximately 0.0005 mK<sup>-1</sup>.